

**Notice of Allowability**

Applicati n N .

09/758,172

Examin r

Bernard E. Souw

Applicant(s)

GROENEVELD ET AL.

Art Unit

2881

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 03 September 2003.
2. ☒ The allowed claim(s) is/are 1-20.
3. ☒ The drawings filed on 12 January 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☒ None of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \* Certified copies not received: \_\_\_\_\_.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
  - (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No. \_\_\_\_\_.
  - (b) ☐ including changes required by the proposed drawing correction filed \_\_\_\_\_, which has been approved by the Examiner.
  - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet.

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |  |
|--|--|
| 1 <input type="checkbox"/> Notice of References Cited (PTO-892)  | 2 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                    | 4 <input type="checkbox"/> Interview Summary (PTO-413), Paper No. _____    |
| 5 <input type="checkbox"/> Information Disclosure Statements (PTO-1449), Paper No. _____               | 6 <input type="checkbox"/> Examiner's Amendment/Comment                    |
| 7 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8 <input type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|  | 9 <input type="checkbox"/> Other   |

## DETAILED ACTION

### ***Certified Copy of Foreign Priority Not Yet Received***

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Europe on 01/14/2000. It is noted, however, that applicant has not filed a **certified** copy of the foreign application (EP 00300246.6) as required by 35 U.S.C. 119(b). The original filed priority document was not an ***original*** certified copy; it was a ***copy*** of the certified original.

### ***After-Final Amendment***

2. The amendment & remark submitted after final rejection filed 09/03/2003 has been entered. The present Office Action is made with all the suggested amendments and remarks being fully considered.

### ***Response to Applicant's Arguments***

3. Applicant's arguments filed 09/03/2003 have been fully considered. The following is the Examiner's response.

3a. Regarding the correct date of Applicant's previous response, Applicant's date of March 5, 2003 was the filing date, whereas the Examiner refers to the date the Response has been entered, i.e., March 18, 2003.

3b. Although this application is now allowed based on a fully different ground, the Examiner remains in disagreement with Applicant's argument on page 7 that "*Nishi is*

*merely concerned about displacement errors due to rotation about the axis and not tilting of the XYZ".* The Examiner maintains that ***Nishi does consider errors due to tilting of the XYZ axis.*** In particular, the Examiner disagrees with Applicant's argument made on page 7/lines 2-3 from bottom, reciting *"the stage 9 must be rotated "inclined" around the axis Z which is perpendicular to XYZ plane"*. As known in the art, the word ***"inclined"*** is always understood as a ***deviation in the vertical direction***, in Nishi's case a deviation of the X axis from the original X axis on the reference XY plane by an inclination angle  $\Delta\theta_1$ . It is ***not*** an angle of ***rotation around the Z axis*** as understood by Applicant, as expressed on page 7, lines 1-2 from bottom & page 8, line 1, *"The statement in Nishi that stage 9 is inclined with respect to X direction refers to the X-Y coordinate system of the stage 9 being inclined, i.e., rotated, with respect to the X axis in the plane XY when rotated around axis Z by an angle  $\Delta\theta_1$ ".* It is to be emphasized that being ***"inclined"*** to the X axis is totally different than being ***"rotated"*** around the Z axis, the latter having been the ground for Applicant's insistence that *"Nishi is merely concerned about displacement errors due to rotation about the axis and not tilting of the XYZ"*.

However, the claim is now allowed in view of Applicant's remark on page 8, lines 9-10, i.e., that *"Nishi does not disclose, teach or suggest providing a calibration system to measure lateral displacement as a function of tilt"*, as recited in Applicant's claim 1.

#### **ALLOWANCE**

4. Claims 1-20 are allowed.

***Reasons for Allowance***

5. An Abbe Arm calibration system for use in lithographic apparatus, in which a lateral ***displacement of a reference point*** in a plane of an object table is measured ***as a function of tilt***, thus allowing the position of the specimen on the object table be accurately determined without an Abbe error, has not been anticipated nor rendered obvious by any prior art. Claims 2-13 are also allowed for being either directly or indirectly dependent on claim 1, which has been allowed for the reason recited above.

Claim 14 is allowed for reciting an Abbe Arm calibration system based on a determination of a ***distance between the surface of the object table and a rotation-invariant point*** of the object table under various, i.e., ***as a function of, tilt angles***. Claims 17 and 18 are also allowed for being either directly or indirectly dependent on claim 14, which has been allowed for the previously recited reason.

Claim 15 is allowed for reciting an Abbe Arm calibration system based on a detection of the ***displacement of a reference point*** on the object table as a ***function of tilt angles***. Claims 16, 19 and 20 are also allowed for being either directly or indirectly dependent on claim 15, which has been allowed for the previously recited reason.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 703 305

0149. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm.

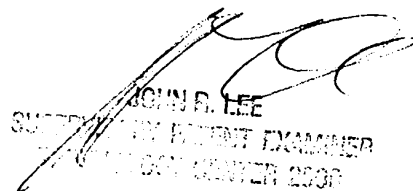
***Communications***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 703 305 0149. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 703 308 4116. The central fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for regular communications as well as for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

bes  
October 30, 2003

  
JOHN R. LEE  
SUPERVISOR  
RECEIVED EXAMINER  
OCTOBER 30, 2003